

Working memory (WM) and executive functions (EF) in aphasic patients

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Keywords: Aphasia; Working memory; Executive functions; Communication
Objective.– To assess WM and EF in aphasic patients with original non-verbal tasks, suitable for their expression and comprehension deficits. We explored the relationship between their WM/EF abilities and communication disorders.

Methods.– The scores of 33 aphasic patients in forward, backward digit span, forward visuospatial span, inhibition, flexibility, updating and fluency tasks were compared with those of 43 controls (Student's *t*-tests). In patients, using Bravais-Pearson *R*, we assessed the relationship between the cognitive scores and the scores on questionnaires measuring the WM complaints [1], on the one hand and the communication disorders [2], on the other hand.

Results.– Analyses revealed lower scores for patients for all the WM and EF tasks (*P* from .014 to < .001). Patients had also significantly more complaints and communication disorders than controls. Scores on the communication disorder scale were correlated to those on the WM/EF tasks.

Discussion.– This study showed genuine deficits in aphasic patients in all the WM/EF domains. These deficits were observed beyond their language disorders and could contribute to their communication difficulties.

References

[1] Vallat C, et al. Brain Injury 2005;19:1157–64.

[2] Darrigrand B, Mazaux JM. Glossa 2000;73:4–14.

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Interactions between language and executive functions: Elaboration of new tests to assess the impact of executive functions on language comprehension

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Keywords: Executive functions; Brain damage; Comprehension.

Background.– Brain damaged patients may suffer language troubles attributable to cognitive functions different from aphasia. The aphasic tests don't bring out these specific troubles.

Objective.– The aim of this study is to evaluate the sensibility in assessing the troubles in verbal comprehension for the proposed tests (Token Test and three new tests to assess Working Memory, Flexibility, Updating).

Methods.– We start a normalization of the tests on control population, and a validation on brain damaged patients, without aphasia. Each verbal task has a matched non-verbal test. For patients, we submit complementary tests: Sentence Comprehension (MT86) and DEX survey (therapist).

Results.– We submitted the tests to brain damaged patients. Results show the higher sensibility of the new tests (compared to the standard aphasic tests) in the assessment of the “executive” comprehension troubles.

Discussion.– The proposed tests allow to refine the assessment of comprehension troubles in brain damaged patients targeting at the altered function: Working Memory, Flexibility, Updating. They bring sensibility and relevance where the standard aphasic tests have limits.

Further reading Azouvi P Couillet J. Mémoire de travail et traumatisme crânien sévère. In: Neuropsychologie de la mémoire de travail, Ed. Solal 2007, Marseille 412 p.

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Comparison of the sensibility of language tests assessed to an aphasic patient with good recovery

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Keywords: Aphasia; Executive function; Assessment

Objective.– Brain damaged patients may suffer language troubles attributable to cognitive functions different from aphasia. The aphasic tests do not bring out these specific troubles.

Methods.– Mrs L., 56-years-old, had a left ischemic cerebrovascular accident, on March 2013, with hematoma of the left internal capsule. Initially, she had a non-fluent aphasia, which clinically recovered well. The language assessment (MT86) submitted 8 months later does not bring out anymore any kind of trouble. We compared those results to executive language tasks: Dice Game, Hayling Tests, and fluencies “Animals” and “words in P”. We also submitted executive non-verbal tasks.

Results.– The results bring out a higher sensibility of the executive language tests, especially for the Dice Game.

Discussion.– Considering this case study, aphasic tests do not allow to bring out specific language difficulties which appear in executive language tasks. Thus they may be related by nature to executive and phasic functions. The executive non-verbal tests confirm this hypothesis.

Conclusion.– The limits of aphasic tests look evident in this case of good recovery after aphasia. Language difficulties related to executive troubles have to be assessed with specific tests.

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Multimodality and error reduction learning in anomia therapies

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Background.– Anomia therapies mainly use errorful learning whereas error reduction learning (ERL) is rarely described. We have created computer-assisted therapies to address anomia offering three distinct treatments for each lexical disorder using a multimodal procedure ERL.

Objective.– To determine efficacy of multimodal procedure ERL in anomia.

Methods.– A single-case design computer-assisted treatment was used in two aphasic subjects: a 63-year-old man (MF) with word-retrieval disorder and a 52-year-old woman (HA) with a lexico-phonological disorder. Each received appropriate therapy to their lexical disorder using a multimodal procedure ERL in three sessions, including intermediate assessments. The effects were tested for trained words, generalization to untrained words, maintenance and transfer of improvement to daily life.

Results.– Specific therapies of word retrieval (MF) and lexical-phonological disorder (HA) were significantly effective showing a generalization effect and maintenance of the improvement.

Conclusion.– This study demonstrates the effectiveness and the maintenance of improvements in both multimodal treatments using error reduction learning in anomia.

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Clinical course of cognitive disorders after cardiac arrest

